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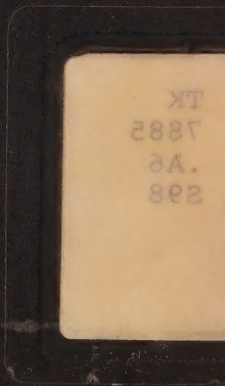
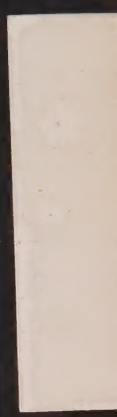


THE SYSTEMS DEVELOPMENT PROCESS IN THE ONTARIO GOVERNMENT

A Report to the
Deputy Ministers' Council

September 1976

Ministry of
Government Services



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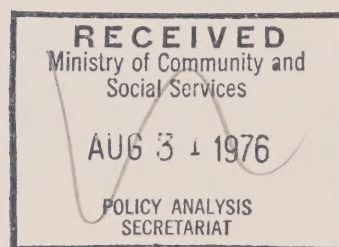
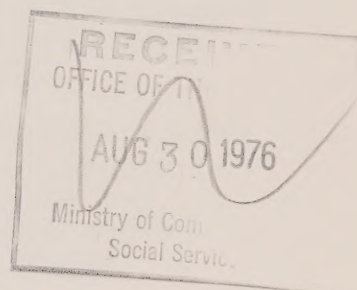
September 1976

Ministry of
Government Services

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Ferguson Block
Queen's Park
Toronto Ontario
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August 30th, 1976

Mr D. Sinclair,
Chairman,
Deputy Ministers' Council,
Room 319,
Legislative Building.

Dear Mr Sinclair,

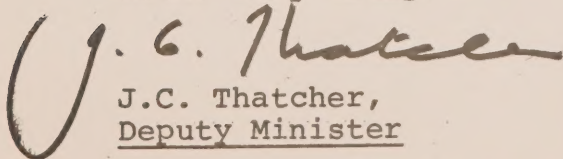
At the meeting of the Deputy Ministers' Council on June 25th, 1976, the Secretary of Management Board presented recommendations from a consulting study concerning the computer systems development function. In the ensuing discussion, it was agreed that I should provide further information to the Council so that its recommendation might be based upon a balanced understanding of the issue.

Attached is a report prepared in response to the Council's request. I have taken the liberty of distributing copies of the report among our colleagues in order that they may have ample time to review it prior to our meeting on September 10th, 1976.

It is perhaps unnecessary to point out that the Ministry of Government Services is as much a user of systems development services as it is a supplier. I am satisfied that our needs as a major user will be competently met in the environment proposed in this report. Moreover, based on recent discussions with each of the Deputy Ministers, I am confident that the needs of our colleagues and their Ministries, as well as the needs of the Government generally, will be satisfactorily fulfilled.

I look forward to the concurrence of the Council and its subsequent recommendation to the Management Board of Cabinet.

Yours very truly,


J.C. Thatcher,
Deputy Minister

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IN THE ONTARIO GOVERNMENT

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September 1976

Ministry of Government Services

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1. BACKGROUND

1. BACKGROUND

Until September, 1973, the systems and programming function in the Ontario Government was completely decentralized. In September, 1973, implementation of the COGP5 recommendations began with approximately one-half of the systems design and programming resources of the government being transferred to the Ministry of Government Services. In September, 1974, some resources from the ministries of Health, Education, and Transportation and Communications were also transferred to the central agency. Acting on advice from the Management Board Secretariat, which was intended to minimize transitional disruptions, the central agency did not intervene in the management of these resources until the end of that fiscal year (1974/75). Hence, the central agency's first full operating year commenced on April 1st, 1975.

The consulting study which has culminated in the Adams Report was initiated part-way through this first full operating year. (It was announced in November, 1975 and actually commenced in January, 1976.) The circumstances which prompted the need for the study at this time have never been properly expressed by the Management Board Secretariat.

Despite the brevity of the period of uninterrupted activity and the disruption of the Adams study, SDS made considerable progress in the 1975/76 fiscal year. For example, the division:

- established a set of technical standards to which they adhere on assignments in ministries which have none.
- established the framework for a competent set of staffing standards.

- established a consistent appraisal methodology which forms the basis for equitable assessment of individuals regardless of the diversity of their assignments.
- established a coherent training program (including access to external curricula) within which each employee has an identified training plan.
- developed and regularly presents a project management course which is specific to the government environment and which is technologically current.
- installed and regularly uses a project/resource planning and control system.
- rationalized the maintenance function for some ministries so that it operates on a central "on-call" basis.
- came very close to meeting its financial objectives despite severe staff reductions and the spending freeze imposed by the "mini-budget".
- to the extent of its available resources (reduced during 1975/76 from 241 to 200), provided competent service to ministries.

A fair conclusion is that SDS is meeting the objectives set out for it and has done so while facing the severe constraints suffered by all ministries. This report will later discuss an answer to the as yet unfulfilled needs of ministries. In the meantime, it is important to remember that fulfilment of most of those needs was not the defined responsibility of SDS.

The COGP5 Report clearly and correctly identified several problems that then existed in the systems function. Among these were the lack of technical standards, the lack of staffing standards, the lack of project planning and control mechanisms and the lack of relevant post-implementation audits or evaluations. These can be considered as basic or fundamental problems with the function as a whole. They exist quite apart from any particular organizational form. (It is interesting to note that the Adams Report re-iterates the same basic problems.) COGP5 recommended that Management Board be responsible for the improvement of these aspects of the systems function.

COGP5, after careful consideration of several options, went on to recommend the centralization of the majority of systems design and programming resources in the government. In doing so, it did not suggest that centralization in itself would provide solutions to the basic problems discussed above. Rather, centralization was meant to resolve the difficulties in the allocation of resources across the government and to facilitate competition with, and comparison to, private sector sources of the same services. To some of the people involved, however, centralization was seen as the most significant and potentially personally harmful part of the COGP5 recommendations. At the time, the issue was discussed only in terms of centralization and not in terms of solving the basic problems. The result has been that since the implementation of COGP5 the basic problems have been largely ignored or, where they have not been ignored, it has been assumed that centralization in itself was the panacea.

The government is today in a position that is similar to that at the time of the discussions surrounding COGP5. It has in hand the Adams Report which identifies some fundamental problems or deficiencies in the systems function in the Government of Ontario, most of which were originally identified by COGP5. The Adams Report recommends

solutions for many of these problems. It seems clear that these or similar recommendations must be accepted in order that fundamental improvements may be made. However, the Adams Report goes on to recommend another major change in organization. The issue of organization has again become the centre of attention in discussions about the report. The fundamental problems are again in danger of being ignored or forgotten. It is important to determine the extent to which any particular organization is the cause or part of the cause of any of the basic problems. It is the contention of this report that the current organization cannot be the root cause of any of these problems since they were shown to have existed prior to its formation.

2. THE SYSTEMS DEVELOPMENT PROCESS

2. THE SYSTEMS DEVELOPMENT PROCESS

This section covers the activities involved in the usual systems development process. A following section will describe the various participants whose functions interact in the process.

Below is a list of stages which normally occur. The time spent on each of these activities will vary directly with the size of the project. The size of the anticipated resource commitment will dictate the extensiveness of the feasibility study and review. Similarly, the complexity of the project will dictate both the frequency and the extensiveness of project reviews. It remains true, however, that for all systems development projects, these steps are normally followed.

- a) Problem or Need Identification
- b) Analysis and Feasibility Study
- c) Selection of Solution
- d) Design
- e) Design Review
- f) Programming
- g) Project Reviews
- h) Implementation and Operation
- i) Evaluation
- j) Maintenance and Enhancement

The following briefly outlines what is done during each of the steps listed above.

Problem or Need Identification

The line manager will usually identify a need or at least identify a problem requiring solution in his

operation. Suggestions for change and/or improvement may also come from sources external to the manager's function such as the ministry's systems group or suppliers of equipment and/or services.

Analysis and Feasibility Study

At this stage, an analyst coherently specifies the problem to be solved. Further, the analyst examines potential solutions to the problem and assesses the related costs and benefits of each. The results of this examination are recorded in a manner suitable for presentation to the line manager and for review in the future should that become necessary.

Selection of Solution

With the result of the foregoing analysis in hand, the line manager selects the solution most appropriate to the situation.

Design

A solution having been selected, the analyst causes a detailed design of the system to be prepared. As part of this stage, estimates of the costs and benefits of the system are further refined.

Design Review

At the completion of the design stage, the line manager reviews the detailed design to ensure that it represents a complete solution. The refined estimates of costs and benefits are also reviewed at this time. Based

upon this review, the decision is made to continue, to continue with modifications or to cancel the project.

Programming

During this stage, the detailed design is translated into a set of computer programs which will do the required processing of the data and produce the desired outputs.

Project Reviews

During the entire process, project reviews are held which report on the status of the project relative to the original time and cost plan. During the programming phase, development cost estimates become more precise and projections of operating costs are refined. The line manager can continually review the actual and projected costs of the project relative to anticipated benefits and make appropriate decisions based upon this knowledge.

Implementation and Operation

During implementation, the full system is tested and the eventual users are trained in its use. These activities lead to the system becoming operational. During the initial stages of operation, the operating costs are reviewed and, where possible, programs are modified to reduce the cost.

Evaluation

After a reasonable period of operation, the line manager does an evaluation of the effects upon the program as a result of the development and implementation of the

system. This evaluation concentrates upon the comparison of the realized benefits of the system with the benefits projected in the feasibility study. This review results in the line manager making decisions regarding the continuation, modification or cancellation of the system.

Maintenance and Enhancement

During the life of the system, there will be a continuing need for maintenance (that is, the correction of faults in the system) and for enhancements (changes or additions to the system which are identified as necessary and/or desirable). The need for maintenance will be identified by failure of the system to operate correctly. The need for enhancements is treated like a "mini-project" and is examined as to the cost of implementing the enhancement and its likely impact on operating costs relative to the benefits of the enhancement.

The systems group in a ministry will, at any given time, be involved in a number of projects each of which will be at a different step in the process. An essential function of the group is the planning, management and co-ordination of the collection of projects underway.

It is important to note that one or more of the steps in the above process are frequently ignored or incompletely performed in systems projects. Feasibility studies, if done, often examine the appropriateness of only one solution; post-implementation evaluation is rarely carried out; the distinction between remedial maintenance (absolutely necessary) and enhancement (judgement) is seldom drawn.

3. PARTICIPANTS IN THE PROCESS AND THEIR NEEDS

3. PARTICIPANTS IN THE PROCESS AND THEIR NEEDS

The purpose of this section is to identify the functions involved in or affected by the systems development process and to define their needs as they relate to the process.

Ministry Executive

In the majority of cases, senior ministry executives are appropriately not interested in the detail surrounding systems development activities in their ministry. Rather, they are interested in an overview of the function's role in the ministry, in gaining an understanding of the impact on the ministry's various programs and in understanding the total cost of systems activities in their ministry.

Unless a ministry executive is to be a direct user of a new system, it is unlikely that he will ever be involved in any of the steps of the process as outlined in Section 2. Nevertheless, in recent individual discussions with almost all of the deputy ministers, the wish was expressed for an opportunity to come to a better understanding of the process itself and the potential applicability of data processing to management problems. An education program to fulfil this need would necessarily have to consider the already heavy demands on the time of deputy ministers and, to be completely fruitful, would have to be predominantly government-oriented. Some deputy ministers (and assistants) have already attended external courses - primarily those offered by equipment suppliers. As yet, no mechanism exists for a government executive to receive such instruction in company with a group of his peers.

A need has also been expressed for a better planning and control methodology within ministries whereby the executive could more easily assess the overall systems plan, its cost and its implementation schedule. A methodology is required wherein the executive could not only assess the plan but could also review progress and expenditures against the original plan. In many cases, the current situation is one in which only the plans for individual projects are available with no consolidation.

In conjunction with the needs described in the preceding paragraph, a concern was noted regarding the cost of systems development services. This concern centred on the prices quoted for internally-supplied services and, in particular, on the apparent discrepancy between salary costs and the rates charged by SDS.

A need was strongly expressed for the establishment of both staffing and technical standards. In the area of staffing, the need was related closely to the intense competition for scarce internal resources across the government. The feeling was expressed that in some cases positions have been filled by a person best qualified relative to other applicants but who was not absolutely qualified at the level at which the position was classified. The long term effect of this situation will be clearly damaging to the effectiveness of government salary expenditures in the systems area.

In the area of technical standards, it was felt that the establishment of a competent set of standards would enhance the ability of non-technicians to understand systems and systems design, would lessen the dependence upon particular individuals who retain much relevant information in their heads and would, over time, reduce the currently heavy maintenance workload through the use of standard programming techniques and through the existence of effective documentation.

Finally, many senior executives recognized the need for a mechanism to identify and, where appropriate, exploit opportunities for the multiple use of data or for the development of systems serving more than one ministry.

Line Managers

In the last few years, there has been an attempt to require line managers to take complete responsibility for the management of systems in their area. Careful thought and recent experience lead to the conclusion that this is an unreasonable demand at the present time. The relative newness of data processing and the extraordinary rapidity of technological change in the industry have militated against line managers in their attempts to come to a complete understanding of systems and their impact. The often confusing technical communications required in the systems function further complicate the efforts of line managers to participate fully in the process. Nevertheless, one can envisage the day when line managers will converse as confidently with their systems advisors as they can now with lawyers, for example, despite not knowing the intricacies of the law. The development of standards and the further maturing of the data processing industry will assist immeasurably. In the meantime, the fundamental need of the line manager is to have available to him a competent, committed systems function in which he can confidently place his trust. The more successful current systems activities in the government are those in which line managers can deal somewhat informally with their systems advisors and can hold them accountable for the achievement of results. Since such relationships appear to be effective, there seems to be little reason for requiring a change in roles - particularly when the ideal situation will likely be comfortably achieved over time.

The foregoing notwithstanding, line managers have expressed a wish for more opportunities to gain an understanding of data processing and the systems function. They have expressed the need in particular for knowledge of current capabilities and how these might reasonably be applied to their functions. As with the ministry executives, there is an implied wish to receive such education in the company of government colleagues in order to be able immediately to discuss what they have learned in the context of government applicability.

Despite the fact that most line managers prefer to delegate planning and management of systems projects to their systems advisors, many have expressed the feeling that there appears to be no standard, government-wide planning and project control mechanism. The existence of such a mechanism would assist them in understanding project progress reports (time and cost). Moreover, a standard approach would ease the transition to new responsibilities when managers are appointed to different positions or ministries.

A further need which has not been expressed, but may be assumed to be valid, is a need for continuing attention to the operating costs of systems. This applies equally to maintenance costs and to the processing costs involved. Any successful efforts to reduce either of these would be appealing to line managers.

Ministry Systems Managers

The following list of needs of ministry systems managers is not likely to coincide in every respect with a list prepared by any given systems manager. It does, however, represent those needs which are within the scope of this report. Most ministry systems managers would add to

this list. Their additions would primarily relate to the specific ministry to which they are attached.

Ministry systems managers need:

- a consistent planning and control mechanism which will satisfy the requirements of project planning and management, the reporting needs of their senior management and the information requirements of Management Board;
- adequate staff to fulfil the needs of the line managers as discussed above;
- advanced technical support expertise available on demand without incurring the expense and difficulty of developing and maintaining such expertise themselves;
- a competent set of technical standards to which they can command adherence by both their own staff and suppliers (internal or external);
- an adequate set of staffing or personnel standards against which they can assess their own staff and those on assignment from outside the ministry and against which they can measure applicants for positions.

Employees in the systems function

Most employees in the systems function fit into one of two categories. First, there are those who wish to have opportunities to advance to more senior and technically complex responsibilities. Second, there are those who wish to have opportunities to advance from primarily technical to primarily managerial roles. In both cases,

there is an expressed need for a consistent program of training and development which is relevant both to their current assignments and to their career development aspirations.

Among employees in the systems functions, there is an expressed wish for a set of staffing standards (both technical and managerial) against which they can measure their current position and the training and experience requirements for advancement to the next position. Competent staffing standards, in the employee's view, also ensure a basis for consistent, equitable assessment of systems staff across the government.

Finally, there has been a need expressed on the part of many employees for a reasonable degree of mobility from ministry to ministry. Even among those who identify their careers with a particular ministry, there has been a stated wish for periods of exposure to one or more other ministries as part of their career development.

Suppliers of services

With the current severe constraints on internal resources, an increasing portion of the government's systems development work is being offered to the private sector. Constraints on funding have led to an increasing insistence upon firm bids. In order to satisfy the occasionally conflicting requirements to adequately perform the government's work and yet to protect themselves from financial loss, external suppliers have a need to be provided with an adequate and complete definition of the work to be performed. Further, given the frequency with which they are expected to respond to requests for service, external suppliers would benefit from consistent government standards in the presentation of design and programming requests. Both the suppliers and government buyers would benefit from consistent and generally understood tendering standards.

Management Board

Management Board, including the Civil Service Commission, has two fundamental needs relating to the systems development process. First, it needs to receive comprehensible budgetary information during the estimates process. It would be advantageous if this information were received in a form which was consistent from ministry to ministry. Second, it needs a basis upon which to audit the line manager's decision-making process, to monitor adherence to standards (both technical and staffing) and to review adherence to its various policies relating to the acquisition of supplies and services. Again, it would clearly be a benefit if these standards were common to all ministries and were accepted and understood government-wide.

If these needs were fulfilled, Management Board's approach to the systems function could become more consistent with its approach to other functions in the government. That is, it could reduce its current frequent intervention in the systems activities of ministries and rely instead upon the usual routine of operational review.

4. PARAMETERS OF A SOLUTION

4. PARAMETERS OF A SOLUTION

In addition to satisfying the variety of needs discussed in Section 3, an effective solution must fulfil a number of other, occasionally conflicting requirements. Some of these are unique to the public service and, perhaps for this reason, were not adequately recognized by either COGP5 or the Adams Report.

The solution must respect the responsibility and authority given to individual ministries in the determination of their system needs and the setting of priorities for the fulfilment of those needs. At the same time, it must competently treat the needs and objectives of the government as a whole in terms of both general systems requirements and consistent, effective administration of the systems function. These needs include the ability to exploit, where appropriate, opportunities for the multiple use of data and information systems.

The approach to the systems function must recognize the varying rates of growth of ministries in the application of data processing and the cyclical nature of the numbers and types of resources required. These varying rates of growth and resource requirements must be accommodated within the public service environment which has some inevitable rigidity in organization as well as continuing constraints on complement. This suggests the necessity for a broad range of systems service procurement options and for the maximum possible flexibility in the assignment of internal resources.

The solution must recognize that the scarcity of government resources (financial and personnel) is, for all practical purposes, permanent. It therefore must provide for satisfactory methods of careful management control of the systems function to ensure that those systems

with the greatest potential return are given priority and that the real costs of all systems activities are clearly understood.

To further ensure the most effective application of resources to ministry management problems, the executive and line management functions must be given the opportunity to come to a better understanding of data processing and its potential applicability and of the systems development process itself. There is no doubt that the systems function will make a more effective contribution when it is serving an informed executive and line management community.

The solution must encourage reasonable long range systems planning in ministries and the appropriate allocation of resources to execute the plan. At the same time, it must provide a mechanism for satisfying the sudden resource requirements imposed by periodic shifts in government policy. The increasingly broad impact of data processing systems further suggests the knowledgeable involvement of senior executives in the long range planning process so that they may better understand the overall effects of the plan and the specific effect of required departures from it.

Expanding upon the thoughts of the preceding two paragraphs, it is fair to say of most government systems managers that their experience has not yet permitted them to gain an overall ministry management perspective and the consequent awareness of senior management's information needs. The solution must encourage not only increased knowledge on the part of executive and line management but also the application of this knowledge in a manner which gives systems managers access to the broader management view.

The solution must provide the government with the ability to cope with the increasing rate of technological change coupled with the increasing cost of personnel resources to apply the more sophisticated technology. It must have the ability to provide ministries with advanced advice and expertise in a variety of specialized technical areas without replicating the cost of this support in many ministries. The manageability of these changes will depend upon the adequacy of the solution in its development of relevant staffing and technical standards.

The solution must include consideration of the career aspirations of individuals in the systems function. Opportunities must be available so that the government can continue to attract, retain and motivate highly qualified and competent personnel. Provision must be made for equitable assessment and assignment of personnel on a government-wide basis.

Finally, the solution must be consistent with the continuing need for financial restraint. To the extent possible, it must offer opportunities for the reduction of administrative costs associated with the systems function and for controlling the costs of continuing activities. It must provide for efforts to reduce the cost of both development and operating activities. It must ensure that the government takes full advantage of cost-saving systems available in the marketplace.

All of the foregoing suggests more active senior level involvement in the solution. Government executives have perhaps been too little involved in the past when fundamental changes were being made and basic decisions were taken in the systems function. The result at the time of COGP5 and the result now is a recommendation to have outside experts guide the implementation of proposed improvements

in the function. There is little doubt that executive management must understand and be involved in what is happening as it increasingly affects them. The solution, to be effective, must be implemented by government managers with a government perspective. They are capable of doing so.

5. A COMPREHENSIVE SOLUTION

5. A COMPREHENSIVE SOLUTION

This report recommends that the systems function be composed of two entities. One of these is ministry systems groups which are adequately staffed to serve the support, analysis, feasibility study and project management needs of the line managers. The second is the central systems service organization with the responsibility to supply some specific services to ministries as needed and the responsibility to meet the general systems needs and objectives of the government as a whole.

In the proposed environment, roles and responsibilities will be as described below.

Management Board

Management Board will undertake its usual responsibilities for budget review during the estimates process, the setting and monitoring of policy relating to management practice and acquisition of supplies and services, and the normal process of operational review. Participation of appropriate officials from Management Board is anticipated during the development of technical standards, staffing standards, service costing standards and the planning and control mechanism. Such participation will ensure their understanding and knowledge of the standards upon which their operational reviews will be based and the acceptability of the information which they will receive from the systems planning process.

Ministry Systems Groups

Ministry systems groups will be responsible for the entire relationship with and support of the line management of their ministry. Their staff will be responsible for the complete systems process in all projects within the ministry, using internal and external resources as required. They will also be responsible for the operational support of installed systems.

Ministry systems groups will be responsible for participating with other ministries and with the central systems service organization in the development of technical standards, staffing standards and education and training programs for executives, line managers and employees. They will also be expected to participate in the selection of an appropriate project planning and control methodology. It is only with this kind of participation that the function can ensure the general acceptability of these standards and their relevance to its activities.

Central Systems Service Organization

The central systems service organization will have the following responsibilities:

- the maintenance and administration of technical standards. In doing so, it will remove an administrative cost which is potentially replicated in all ministries. The development and modification of technical standards will be the responsibility of an advisory group representative of all ministries.

- administration of education and training programs. With responsibility for the definition of required programs again resting with a representative advisory group, administration by the central systems service organization will reduce support costs incurred by most ministries. Further, drawing enrollees from across the government will permit greater flexibility and frequency in scheduling specific programs. This advantage applies equally to all three levels - executive, line management, and technical.
- maintenance and administration of the selected planning and control system. Again, to reduce the administrative support cost in ministries, the central systems service organization will maintain and support the selected system.
- maintain a supply of personnel capable of providing analysis and design assistance. In doing so, the central systems service organization will satisfy the occasional need in most ministries for additional resources at this level. It will also satisfy the frequent need for an "outside" point of view on some problems.

Further, in this role the central systems service organization will be satisfying the expressed needs of many employees to gain exposure to one or more ministries in addition to the ministry in which they currently reside.

Some of these individuals will be used in the presentation of training programs and in the analysis, design and implementation work associated with multiple ministry systems.

- maintain a supply of programming resources. In this role, the central systems service organization will become the entry point for most of the junior additions to the systems function in the government. It will provide for their technical development to the point where they are ready for analytical or managerial duties at which time they will join the central systems service organization's analysis and design staff or will be capable of performing similar functions for a ministry.

The existence of this central pool will satisfy the need to provide ministries with the flexibility to expand or contract their resources according to project demands. It is in this function (the programming function) that demand for resources most usually increases and decreases.

- develop and maintain a source of technical support expertise. As the technology develops, it is prohibitively expensive for individual ministries to develop and maintain technical support expertise in every area in which they may require advice and assistance. Further, the level of problem on which such advice and assistance is needed frequently has implications related to aspects of the machinery involved.

This suggests that an appropriate technical support function be closely aligned organizationally with the computer services function. In fulfilling this role, the central systems service organization will make available to all ministries a high level of advanced expertise on demand.

Such a group will provide an opportunity for several valuable members of the government's systems function whose current aspirations lie in the area of advanced, highly technical responsibilities as opposed to application development.

This group will act as a resource for those responsible for technical training programs and for optimization projects.

- the maintenance of a team responsible for undertaking optimization projects. Optimization is the process of modifying computer programs with the objective of reducing their operating costs. Such modifications do not affect the application logic of the programs; they deal predominantly with technical characteristics of computer languages and of the machinery itself. The primary effect of this group's activities will be to reduce the operating costs of ministries. Optimization activities are infrequently performed now since new development and maintenance of installed systems tend to take priority in personnel resources. Such a group, with the advice

of the technical support function, will have a profound effect on computer system operating costs.

Optimization projects are highly effective training assignments for programmers who, in the course of the project, learn a great deal about the most efficient method of programming and tend to apply this knowledge in future assignments.

(As a by-product for the government as a whole, optimization will delay requirements for increases in the installed computer capability. This is because costs of running programs reflect the usage of computer systems resources. Lower operating costs, then, mean that less resources are being used. The resources thus released are available for new applications.)

- the development of expertise in available systems which have general applicability. There are an increasing number of programs which have been developed elsewhere and which are not specific to any particular discipline. Many of these are highly effective tools and could be of substantial benefit to all ministries. The area of text processing is an outstanding example of such a system. Their implementation, however, usually has a substantially lower priority than the satisfaction of the specific application needs in a ministry.

The central systems service organization will undertake to develop expertise in such programs and will implement them (including the training of users). It will maintain and administer these programs on behalf of all ministries, thereby ensuring the availability of these important tools without consuming any of the ministries' already scarce talents.

- identification and implementation of appropriate multiple ministry or government-wide systems.
In those areas where data and/or information systems could be used by more than one ministry, the central systems service organization will undertake to implement the system on behalf of the ministries involved. A successful group in this area would have the effect, where appropriate and agreed by the participating ministries, of making data and systems available to any interested ministry without drawing upon the limited systems resources of any particular ministry.

This solution provides for cost reduction and/or avoidance in the following ways:

- a) Administrative support for technical standards, training programs and the planning and control mechanism will be the responsibility of one function rather than having the costs associated with this support replicated in many ministries.

- b) The cost of developing and maintaining the increasingly important technical support function will be undertaken once, thereby avoiding the cost associated with each ministry attempting to develop an appropriately broad range of advanced technical expertise.
- c) The operating costs of installed systems will be reduced through the efforts of the optimization team.
- d) General administrative costs may be reduced through the use of systems which have general applicability (such as text processing). Further, where such systems are used, support and maintenance for them will be undertaken centrally, thereby avoiding the assignment of resources by each participating ministry.

It is the conclusion of this report that such a structure with responsibilities as defined will effectively and efficiently satisfy the needs of ministries and the needs and objectives of the government as a whole while providing an environment consistent with the aspirations of the individuals involved in the systems function.

6. SUMMARY OF RECOMMENDATIONS

6. SUMMARY OF RECOMMENDATIONS

This report recommends that:

1. the responsibility and authority of individual ministries to establish and set priorities for the systems function in their jurisdiction be re-affirmed;
2. the responsibility of line managers for the management and delegation of duties in the systems process be re-affirmed;
3. staffing standards be developed to guide the appropriate recruitment, assignment and assessment of individuals in the systems function;
4. technical standards (including tendering standards) be developed to guide the systems development process;
5. a standard project planning and control mechanism be implemented for the purposes of budget preparation, project planning and progress reporting;
6. costing standards be developed to assist in consistent planning and estimating and to ensure equitable distribution of development and maintenance costs;
7. the central systems service organization be adequately organized and strengthened in order to fulfil the service roles defined for it in this report;

8. Management Board assume a role relative to the systems function of:

- a) developing managerial and administrative policy;
- b) reviewing budgets as part of its normal funding responsibilities;
- c) monitoring adherence to existing policy as part of the normal operational review process.

7. IMPLEMENTATION

7. IMPLEMENTATION

The Adams Report recommended an approach to the implementation of vitally needed improvements in the areas of:

- a) Personnel and staffing standards
- b) Technical standards
- c) Planning, control and evaluation standards

This report concurs generally with the structure of the approach which involved an Advisory Committee, a Director of Implementation and a separate Task Force responsible for each of these three areas. A fourth Task Force is recommended to deal with Service Costing Standards. It rejects, however, the implication that the government cannot internally produce the necessary objectivity, independence and "seasoned judgement" to satisfactorily achieve solutions to the identified problems. The requisite number of impartial and experienced persons are readily available within the Service to perform the functions of the Advisory Committee. Such a group will have the added benefit of their collective experience in government against which to measure the workability of the solutions developed. Further, the individual task forces can be more than adequately staffed from among the many competent individuals within the systems function in the government. The senior executives of the government can surely command from these people the necessary objectivity and devotion to the task at hand to ensure the satisfactory achievement of the objectives.

Accordingly, it is recommended that an Advisory Committee be established, constituted as a sub-committee of the Deputy Ministers' Council. This Advisory Committee, chaired by the Deputy Minister of Government Services, will ensure that the intent of these recommendations is realized. The Advisory Committee will designate a Co-ordinator of Implementation who will be responsible for the four Task Forces described below.

Personnel and Staffing Standards

A Task Force should be created which will report to the Co-ordinator and which will be composed of a representative from the Civil Service Commission, a representative of the personnel function in the government and two or more senior systems officers. This Task Force will divide its activities into two distinct sections. One section will deal with the junior and intermediate technical grades; the other will deal with senior technical grades, project management functions and specialist functions.

The Task Force will draw from existing sources of material within the government (e.g. job specification guidelines existing in SDS, specific job descriptions existing in the Civil Service Commission), from sources identified in the Adams Report and from such other sources as they discover to be relevant.

It is reasonable to assume that this Task Force can be constituted by October 15 and that, properly directed, it can complete its work no later than March 31, 1977. The majority of the work will

involve the identification and definition of the various distinct functions in the systems area and the definition of appropriate levels of experience and competence within each function. This Task Force will also be required to prepare a plan for the ministry-by-ministry implementation of the developed standards and to propose an appropriate approach to the continuing monitoring of the standards.

At the conclusion of this activity, the Review Committee will propose an appropriate mechanism for the continuing review and refinement of the developed standards to ensure that they continue to reflect changes in function and development in technology.

Technical Standards

A Task Force should be created which will report to the Co-ordinator and which will be responsible for the development and implementation of technical standards (including tendering) appropriate to the government environment. The Advisory Committee will determine the sequence in which standards are developed for the various aspects of the systems development process.

In its work, the Task Force will make use of the best of standards existing in some ministries, the results of an SDS/Ministry of Revenue standards project which is currently in progress and material available (but never used) at Management Board.

This Task Force can be constituted well before the end of October, 1976, with a reasonable expectation that development of all phases could be completed by June 30, 1977. It is expected that the developed standards will be implemented in all ministries by December 31, 1977. Implementation will have to be on a ministry-by-ministry basis to ensure that each ministry's specific requirements are met.

The Advisory Committee will designate a Permanent Committee to take over the continuing refinement and development of standards. This Permanent Committee will be constituted no later than September 30, 1977, and will have the responsibility of ensuring that the standards remain current with changes in technology. The central organization will have the responsibility for the maintenance and administration of the standards. It will participate actively in the Task Force and be in a position to take over the maintenance and administration of the standards phase by phase as they are developed. The Advisory Committee will ensure that the central organization is appropriately organized and staffed to undertake this function.

Planning, Control and Evaluation Standards

A Task Force should be created which will report to the Co-ordinator and which will be composed of a representative from Management Board, an informed user and two or more senior systems managers.

This Task Force will review methodologies and mechanisms currently existing in the Ontario Government (e.g. PRIDE, PAC II), other systems and methodologies and sources identified in the Adams Report.

This Task Force will be constituted by October 15, 1976, and could reasonably be expected to have made a choice by December 31, 1976. Implementation of the selected mechanism and/or methodology on a ministry-by-ministry basis would be completed by March 31, 1977.

The Advisory Committee will put in place an appropriate mechanism to ensure that improvements in the process are made as necessary and that the information requirements of Management Board continue to be met. The central systems service organization will maintain and administer the selected mechanism on behalf of all users including Management Board. The Advisory Committee will ensure that the central systems service organization is appropriately organized and staffed to do so.

Service Costing Standards

A Task Force should be created which will report to the Co-ordinator. Its composition will be at the discretion of the Advisory Committee. This Task Force will review and, if appropriate, recommend changes in the method of recovering the costs of systems development services from line functions. This review will include the costs of both ministry systems groups and acquired services.

The Task Force will also review the cost of administrative and support services provided by the central systems service organization and provide the Advisory Committee with options for the equitable financing of these costs. Their primary objective in this area will be to ensure that the cost to the government does not increase or, if it does, that the increased cost is adequately offset by related benefits. That is, they must ensure that the net cost to the government does not increase.

This Task Force can be constituted by the end of October with the objective of completing its work by February 28, 1977.

Organization

a) User ministries

It is concluded that each Ministry has the responsibility to ensure that its systems function is appropriately organized and oriented to most satisfactorily meet that ministry's objectives. Organization and staffing level questions are properly settled according to each ministry's priorities and in the normal course of discussions and agreements with Management Board in the areas of organization and complement.

b) The central systems service organization

In those areas where the central systems service organization is given responsibilities in much the same manner that any other program is given a mission, it is clearly the responsibility of the Ministry of Government Services to appropriately organize itself to execute those responsibilities.

In the current recommendations, these responsibilities include the maintenance and development of a competent technical support group, the maintenance of a comprehensive training and development administration function, the maintenance of a competent supply of analysis, design and programming strength and the creation of the group responsible for the identification and implementation of multiple-use systems and packages of general applicability. In areas such as the maintenance and administration of technical standards and of a planning and control mechanism, the Advisory Committee will ensure that the central systems service organization is appropriately organized and staffed to effectively support these activities.

Management Board Policies

Management Board should, at the appropriate time (and perhaps in concert with the Advisory Committee), undertake to review current policies and/or develop new ones to reflect the proposed alignment of roles and responsibilities. In this context, the Secretariat should participate in the review of the charge-back concept as it applies to systems development and modify its policies, where appropriate, to ensure that:

- a) programs are being charged with the full cost of services including those being rendered by individuals on the ministry's staff, and
- b) an equitable method is formalized for funding (or otherwise paying for) the support and administrative services rendered by the central systems service organization to all ministries.

Management Board should implement these policy changes concurrently with the achievement of the various objectives of the Task Forces and the Advisory Committee.

Implementation Costs

The proposed approach to implementation will result in no cost to the government beyond that projected for the systems function in the 1976/77 and 1977/78 fiscal years. It is true that some individuals working on the various task forces would have been assigned to other projects. On the other hand, assigning high priority to the work of these task forces (and assigning personnel to staff them) is similar to the necessary re-ordering of priorities which occurs in the normal course of work.

The cost of any external supplies or services required (expected to be minimal) will be covered by similar changes in priorities with respect to the services and supplies allocations in the appropriate ministries.

The long term benefits of assigning personnel to this implementation will be substantial.

- Staffing standards will provide a basis for the assurance that salaries are commensurate with the real qualifications and capabilities of incumbents in a function whose recent salary progress has been remarkable. A reduction in the overall rate of salary growth in the function is anticipated as a direct result.

- Technical standards will lead to more orderly and less costly project development and, eventually, to substantially lower maintenance costs. Further, the costs of tendering are inevitably reflected in the price of services. The tendering standards phase will result in a process in which these costs are lower.
- Costing standards will lead to a more equitable distribution of the costs of systems development as well as assisting in the selection of new systems and enhancements with the greatest return on investment and the abandonment of those with unacceptable rates of return.
- A competent project planning and control mechanism will more accurately assess the total costs of projects and will usually identify significant potential over-runs much earlier in the process.

This qualitative review of benefits relates only to the effects of implementing the specific standards. That is, it deals with the benefits to be realized in return for the one-time implementation effort. The benefits related to the activities assigned to the central systems service organization are stated at the end of Section 5.

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